HEALTH AFFAIRS

Military Health System
Information Management/Information Technology
Benefits Management Program

Supplement (Toolkit) - Part 2

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Preface

This document is Part 2 of the Military Health System (MHS) Information Management/Information Technology (IM/IT) Benefits Management Program Supplement (Toolkit). This document supplements the MHS IM/IT Benefits Management Program Guidebook and contains a detailed summary of both the Office of the Director (OD) Program Analysis & Evaluation (PA&E) Automated Information System (AIS) Economic Analysis Guide and the Department of Defense (DoD) acquisition policy; a glossary of benefits management terms; and, an acronym list. It is important to note that the OD PA&E AIS Economic Analysis Guide was never formerly approved. However, it still provides valid and useful management guidance, and should be viewed as such.

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1. SUMMARY OF THE PROGRAM ANALYSIS & EVALUATION (PA&E) AUTOMATED INFORMATION SYSTEM (AIS) ECONOMIC ANALYSIS GUIDE

This section provides a summary of the PA&E AIS Economic Analysis Guide, May 1995, and it is intended for managers who a need quick and concise reference to the PA&E guidelines for AIS economic analyses. It is not intended to replace the complete PA&E guide but, rather, serve as a roadmap to the more detailed information contained in the document.

1.1 Objectives

The objective of the AIS Economic Analysis Guide is to provide and fully support AIS acquisition program Life Cycle Management (LCM) and resource allocation decisions in the Department of Defense (DoD) Program Objective Memorandum (POM) and budget review processes.

The objective of the Program Manager's Guide PA&E AIS Economic Analysis Guide is to facilitate the understanding of the information contained in the PA&E AIS Economic Analysis Guide.

1.2 Structure

The structure of this guide follows the same format that is contained in the PA&E AIS Economic Analysis Guide. There are two main parts: Part 1- Requirements and Responsibilities and Part II– AIS Economic Analysis Methods. Part 1 contains two chapters which focus on the Requirements (Chapter 1) and Responsibilities (Chapter 2). Part 2 contains three chapters: Chapter 3 covers cost analysis techniques, Chapter 4 contains benefit analysis techniques, and Chapter 5 discusses budget interface.

1.3 Introduction

What is AIS Economic Analysis? AIS Economic Analysis includes any and all quantitative analysis employed by the Department to estimate, review or validate AIS program costs and benefits. AIS Economic Analysis is required to determine the best executable AIS program acquisition alternative available to the Government. The best alternative being that which meets critical mission requirements at the lowest life-cycle cost, expressed in present value, and/or provides the most advantageous Return On Investment (ROI). The AIS Economic Analysis should be reviewed and determined to be reasonable at each acquisition oversight milestone review or at any program review that approves the LCM process beyond the last previous oversight review.

What is the AIS Acquisition Program Economic Analysis (APEA)? The AIS APEA is a specialized form of economic analysis undertaken to determine the best AIS acquisition program alternative available to meet an approved Mission Needs Statement (MNS). An AIS program, however, is only one of many possible investment alternatives required in a DoD function. Consequently, an AIS APEA may be considered to be an integral subset of a DoD Functional Manager's Functional Economic Analysis (FEA) and vice versa. The APEAs directly support DoD acquisition decisions, and, therefore, must meet rigorous analytic required by the acquisition program LCM oversight (milestone review and approval as required by DoD 5000-series and 8120-series regulations). Also required Major AIS (MAIS) program milestone reviews must be supported by Independent Cost Estimates (ICEs).

How are AIS APEA and FEA related and linked?

The FEA and AIS APEA are distinctly different but mutually supportive and interactive forms of AIS Economic Analysis that are required to support different management decisions dependent on the size, complexity, risk, impact, resources, and life-cycle phase of each AIS program. They compliment each other in a streamlined, seamless manner that requires a single documentation and data entry effort for each Milestone Decision Authority (MDA) review.

1.4 Chapter 1 Requirements

Chapter 1 presents the requirements for economic analysis, identifies the AIS general procedures, and gives AIS Parameters and Definitions. The fully documented text on APEA requirements is contained in the complete PA&E guide on pages 1 through 37. The following is a brief summary of the major points of Chapter 1:

- The Economic Analysis requirement addresses programs that are supported by commercial-off-the-shelf hardware and support administrative functions.

- Economic Analysis is a quantitative and systematic method for determining how best to allocate resources among competing programs or alternatives.

- Subsequent to milestone 0 approval for any AIS acquisition program or modernization effort that entails expenditure of combined government resources in excess of $2 million (Fiscal Year (FY) 1990 constant dollars) will require an AIS APEA to allow for the continuance of program expenditures or advancement beyond any previously approved limits.

- Any program that requires more than $25 million (FY 1990 constant dollars) to implement will require the development of an AIS Cost Analysis Requirement Document (CARD) as defined in DoD 5000.4-M. The AIS CARD will be the baseline analytic document that supports all AIS APEA. Any AIS acquisition program that is designated a

MAIS will require an Independent Cost Estimate (ICE) or Component Cost Analysis (CCA) as defined in DoD Directive 5000.4.

- It is expected that selected business AIS acquisition investments will have a minimum ten percent (10%) Return on Investment (ROI) when compared to the status quo alternative.

- AIS Economic Analysis General Procedures are contained in Chapter 1, Section 1.3. These procedures outline specific AIS APEA responsibilities.

There are four different thresholds for delegation of the review and validation responsibility associated with AIS programs. MAIS is defined as more than $25 million in any FY; Component AIS is more than $10 million in any FY; Minor (Command) AIS is, more than $2 million in any FY; and Project (Other) AIS is, less than $2 million in any FY. Each level requires that certain reporting requirements be met. For more detailed information, see Independent Review and Validation Authorities, Chapter 1, Section 1.3.3.1.

Specific review objectives must be met in preparation of an AIS APEA. APEA validation standards become higher as the AIS programs mature which require different levels of management review. These are briefly discussed below. Detailed information on review objectives is contained in Chapter 1, Section 1.3.3.2.

- Milestone 0—Validate the scope and magnitude of the AIS program within the context defined by the FEA.

- Milestone I—Validate the accuracy of the estimated life-cycle cost and benefits of each AIS program alternative.

- Milestone II—Validate the accuracy and reliability of the Functional Economic Analysis for the Preferred AIS Alternative.

- Milestone III—and Subsequent Milestones - Revalidate the accuracy and reliability of the AIS APEA for the Preferred AIS Alternative.

Development of an AIS estimate should start at least one year prior to a required LCM review. At least six months should be allowed for completion of an Independent Cost Estimate (ICE). These lead times are based on completion of a Functional Economic Analysis (FEA) and a Milestone 0 approval.

Detailed information on AIS Parameters and Definitions are found in Chapter 1, Section 1.4. This section includes information and definitions on the following:

- Major AIS
- AIS Alternative Costs

- Scope of an AIS Alternative
- AIS Program Costs
- Sunk Costs
- AIS Modernization Costs
- AIS Program Alternative Life-Cycle Costs
- AIS Return
- Preferred AIS Alternative
- Cost Analysis Requirements Description (CARD)
- Critical Parameters for AIS APEA

The specific requirements for each Major AIS program Cost/Benefit review and validation are normally tailored for each program. Specific requirements are documented in the AIS Economic Analysis Development Plan (EADP). Cost/Benefit documentation is submitted in standard input spreadsheets formats, using standard cost/benefit data elements. The complete data element structure and definitions are provided in the complete PA&E Economic Analysis Guide in Attachment A.

1.5 Chapter 2 Responsibilities

Chapter 2 explains the different roles that individuals play in accomplishing AIS Economic Analysis in support of AIS Program acquisition decisions. The fully documented text on responsibilities is contained in the complete PA&E guide on pages 38 through 40. The following is a brief listing of the major points of Chapter 2:

- The Milestone Decision Authority (MDA) is the DoD official designated by the Assistant Secretary of Defense (ASD) to act as the acquisition program review and milestone approval authority for a specific AIS.

- The FEA Agent is the individual designated by the Principal Staff Assistant (PSA) who has overall management responsibility for the development of AIS documentation requirements.

- Office of the Director, Program Analysis and Evaluation (OD(PA&E)) ensures that costs associated with DoD plans, program, and budgets are accurately presented and will support approved policies, standards and defense objectives. The OD(PA&E) acts as the DoD authority for AIS Economic Analysis and reviews and validates DoD AIS program APEAs and Life-Cycle Cost Estimates (LCCEs).

- AIS Acquisition Program Manager develops, documents, and presents to review officials the Program Office Life-Cycle Cost Estimates (PLCCE) for executable program alternatives.

- The Independent Cost Agent (ICA) is an office or individual who is independent of the Program Manager and is not answerable to anyone directly associated with the AIS program office of the functional process that will be directly impacted by the AIS acquisition program. The ICA prepares and presents to reviewing officials a complete DoD Component Independent Cost Estimate (ICE) for the preferred alternative.

- The DoD Independent AIS APEA Validation Authority acts as the DoD AIS Economic Analysis review authority for delegated or less than major AIS acquisitions. In addition, it reviews assigned AIS APEA estimates and advises the MDA as to their completeness and accuracy.

- The OSD PSAs is charged with leading the DoD's Functional Process Improvement efforts.

- Heads of DoD components ensure that the DoD's AIS program economic analysis policies are applied to AIS programs under their purview.

1.6 Chapter 3 Economic Analysis Techniques

Chapter 3 discusses the different costing techniques used to develop LCCEs. This chapter also explains how to construct a cost model, selecting relevant costs, sensitivity and risk analyses, multinational acquisitions, and what is required for back-up documentation. The fully documented text on economic analysis techniques is contained in the complete PA&E guide on pages 42 through 50. The following is a brief summary of the major points of Chapter 3.

The techniques to develop LCCEs should take into account the stage of the acquisition cycle that the AIS system is in when the estimate is made. Until actual costs are available, the use of parametric costing techniques is an acceptable approach in the development of the cost estimates. Parametric, analog, and engineering methods are used for Milestone II reviews. Projects of specific costs based on test results should be used predominantly for preparing estimates for Milestone III and higher reviews. Before selecting a cost methodology, comparisons or cross-checks of various approaches are recommended. The most commonly used costing methodologies are cost estimating relationships (CERs), analogy, engineering (bottoms up), and prototype.

Cost Estimating Relationships (CERs)—A CER is a relationship between two or more variables where one is independent and one is dependent. The CER equation is developed statistically using multiple regression analysis using a historical database of performance parameters with their relative costs. When using CERs, it is important to include information on the specific form of the CER, its statistical characteristics, the database used to develop the CER, and the assumptions used in applying the CER.

Analogy—An analogy is a technique used to estimate the costs of an unknown item by comparing the unknown to a known (proven) item and its costs. In the case of an AIS program such as the

Clinical Integrated Workstation, an analogy would be the Composite Health Care System (CHCS), which is a deployed system. It is important to note that when using an analogy, one must extrapolate the relevant data and costs from the proven system and normalize that information so that it represents the system to be estimated. This includes adjusting for inflation, applying complexity or technology factors to represent the system being estimated, modifying or upgrading technical specifications, or adjusting costs to reflect current pricing of items.

Engineering (Bottoms Up)—An engineering approach is when a system's costs are derived by estimating the costs of its components and sub-components and summing these costs. An example would be the estimation of a server. A server consists of a monitor, Central Processing Unit (CPU), Read Access Memory (RAM), bus, power supply, tape back-up, hard drives, modem, uninterruptible power supply, etc. Each component is then priced and summed up. An engineering approach should be used whenever data are available at the subsystem, component, or sub-component level of detail.

Prototype—Actual cost experience on prototype units, early engineering development hardware and software, and early production hardware for the program under consideration should be used to the maximum extent possible, recognizing that prototype units are frequently "hand made," do not necessarily reflect actual production methods or materials, and would need adjusting.

Selecting Relevant Costs—A Cost Element Structure (CES) establishes a standard vocabulary for identifying, classifying and presenting the major costs. Costs can be presented at various levels using the CES. The CES uses a numbering system to denote the level at which the costs are estimated. The cost element structure and definitions are provided in the complete OD (PA&E) Guide, Attachment A. There are a number of considerations that must be made in selecting relevant costs. These are discussed below:

- The greatest level of accuracy should be achieved in developing cost estimates. There is a practical limit to the amount of resources that can be applied to the effort. In addition, the application of the cost estimate often determines the method used to derive the estimate.

- When a program includes multiple systems that will be produced, delivered, or installed incrementally, there will be a period in the life cycle when units have been transitioned to the user and are operating while other units are still being produced. It is important that all these costs be included in the life-cycle costs. In addition, some emerging systems must be operated in parallel with the systems being replaced. During system check-out or shake-down, both systems incur operating costs that could be significant. These duel operating costs should also be included in the life-cycle costs.

- All costs are reflected in constant year dollars and use the current year as the base year. All benefits are also reflected in the same constant year dollars.

- The sunk costs of a system are those costs that are already expended or obligated and cannot be impacted by the decision to be made - those costs that will not change if the decision is made to cancel the program. The total sunk costs for each of the elements in the CES should be displayed from actual or programmed start date to the current fiscal year. While it is important to include these costs in the LCC, they should not be included in a Cost and Operational Effectiveness Analysis, trade-off analysis, or decision-focused analyses.

- In constructing a cost model, no one approach is best for all cost elements or situations. In general, the context of the problem determines the optimal cost estimating process. This includes the phase of the acquisition program, the decision to be made, the accuracy and resolution required in the estimate, and available data. There are various models that can be used to develop a cost estimate—ranging from a simple spreadsheet to an automated software package that uses embedded regression analysis and CERs. A good cost model has the following characteristics:

- The model should be constructed so that it can be easily understood by any user. It should be structured so that it can be useful in the early phases of the acquisition process and can evolve to accommodate more information as the program continues through its life cycle.

- The basic cost structure should not change as a program progresses through the development and procurement process. However, the basic elements and their sub-elements should be defined and displayed to greater level of details. (See Attachment A of the complete PA&E Guide.)

- The data elements of the cost estimates should be consistent with similar elements of each alternative. The estimating model should allow the element estimating techniques to vary as the program progresses through the acquisition phases.

- When using software models, ensure that the application software development cost and sizing is calibrated only with data from completed, validated, and tested programs to include overall system integration. Further, calibration data for software development must include administrative and/or overhead (project management), facilities, equipment, tools, training, learning and orientation, analysis and design, coding, test and validation, system integration, implementation, documentation, government-furnished equipment and services, related studies and research, leased support, and estimated fully burdened manpower costs required to complete development.

The cost estimating methods should be sensitive to the full range of development, test, procurement, and operation and system initiatives, as well as changes that will impact a major system during the various phases of the acquisition process. Therefore, it is useful

to perform sensitivity and risk analyses that show the magnitude of the uncertainty and risks and explain the method used to establish range boundaries. The sensitivity of projected costs to critical program assumptions should be examined. This should include factors such as learning curves, technical risk of failures, changes in performance characteristics, schedule alternations, and variations in testing requirements.

Program estimates involving multinational acquisitions should include the impact on cost to the United States (U.S.) Government of license fees, royalties, transportation costs, and expected foreign exchange rates, as appropriate.

Back-up documentation should be complete and should include an extract of the CARD in the life-cycle cost estimate covering the underlying characteristics, cost drivers, ground rules, and operational considerations used as a basis for the cost estimate. Like the cost estimates, the level of detail contained in the back-up documentation will change as the system matures from Milestone II through Milestone IV. There are thirteen sections that should be included in the back-up documentation. These are presented below:

- *System Overview*—Includes the system configuration, its function(s), its relationship to ancillary systems, key performance parameters, system characteristics, technical and physical description, environmental impact expected, and manufacturing material, processes, parts, workmanship and commonality.

- *Software Description*—The functional software, operating system software, and commercial off-the-shelf (COTS) software should be identified to include a functional description, method used to define the scope of the development effort, coding languages to be used, method to be used in developing software, amount of new/modified software and all models used to derive the cost estimate.

- *Human Performance Engineering*—Included should be the special or unique human performance and engineering characteristics.

- *Organizational Concept*—Include the system support structures, deployment locations, and interface with the user communities.

- *Logistics*—Include the maintenance support concepts, sparing and pipeline considerations, Integrated Logistics Support and Interim Logistics Support considerations, support equipment requirements, and re-supply and structure.

- *Training*—Include the training structure and organization to field and support the system. Factory training requirements, maintenance trainers, and the use of simulators should also be addressed.

- *Delivery and Installation*—Include the schedule for delivery and installation by year. A master schedule should also be included showing major events by phase,

milestones, contract awards, design review, test events, concurrent development efforts, initial operational capability, full operational capability, etc.

- *System Activity*—Include the level of activity of the system and/or sub-system after reaching maturity operating hours, number of shifts, scheduled downtime, overhaul interval, etc.

- *Inter-Agency Support*—Include a discussion on inter-agency support, Memorandum of Understanding (MOU), co-development efforts, co-use of facilities, joint ventures, etc.

- *Facilities Construction*—Include a discussion of any construction projects or real property acquisition required to facilitate system development or operation.

- *Manpower Requirements*—The total manning requirements of the system and the manning impacts of the system on the user community should be reviewed in great detail. The projected annual manning requirements of the system, both at the total system and unit level, should be identified. Each time a delta figure is shown, plus or minus, this difference should be fully explained in a narrative attachment. Discuss specifically, how the proposed system will change the manning requirements and the time phasing of these changes, if appropriate. Include the system total, by year, as an element of the delivery and installation schedule.

1.7 Chapter 4 Benefit Analysis Techniques

Chapter 4 presents an approach on how to conduct a benefit analysis. This chapter covers five main topics: identifying benefits, quantifying benefits, discounting and present value, ROI, and estimating non-quantifiable benefits. The fully documented text on benefit analysis techniques is in the complete PA&E guide on pages 51 through 65. The following is a brief summary of the major points of Chapter 4.

The objective of a benefit analysis is to determine how much added value an alternative has relative to other alternatives been considered for a given functional area. This is accomplished by determining whether the value of the alternatives being considered exceeds the costs of not doing the job at all.

The impact of better information to make better, more timely decisions can be difficult to assess. The greatest success in quantifying this impact is often most easily understood in terms of the cost to the general welfare. In the case of AIS systems, the value of implementing automation in the healthcare environment is to increase efficiency (reducing the amount of time required to perform a particular function or providing better and more information sooner) thus improving the delivery of healthcare services to the target population. But the real issue is the delta between the status

quo (business as is) capabilities and the proposed system capabilities, which is the process of comparing one or more alternatives against the status quo.

In quantifying this efficiency, it is assumed that the marginal efficiency rate of the referred alternative is assumed to be 100 percent, i.e., every potential dollar can be saved. This constitutes a theoretical savings and a direct causative relationship between mission capability (delivery of healthcare) and AIS efficiency. In reality, though we may validate potential savings based on theory, such estimates must be decremented to reflect the likelihood that in the real-world many other factors may reduce the impact of an improved AIS, and, therefore, potential savings must be carefully reviewed to ensure that there is not unacceptable degraded mission capability as a result of the implementation of the AIS system.

The system definition and standard life-cycle definition are applicable to benefits determination and the Cost Benefits Analysis (CBA) process. Benefits should flow from clearly stated definitions of system outputs linked to the mission, should include the viable alternatives, and include all program alternative costs as discussed in Chapter 3. Benefits should be quantitatively expressed in order to be considered in the CBA. Sunk or partial program costs already incurred and their associated benefits must be attributed to the status quo (business as is) baseline alternative.

Formal benefits analysis of alternatives should be developed for all major programs at the initial budget submission and for all presentations thereafter. If funds have been allocated to system's development prior to mission need approval, economic analysis documentation, as required by the budget, should be provided for review.

Identifying Benefits: A list of benefits (quantitative and non-quantitative) should be developed for each alternative. Benefits should relate to specific targets, such as, organizational goals, objectives, missions, and functions that are directly related to the system implementation and deployment, as well as the costs incurred. The Delphi technique (forming a group of individuals with knowledge of the project being analyzed to identify benefits) is a useful method for identification of benefits.

Quantifying Benefits: There are two major groups of benefits: cost reduction and value engineering. Cost reduction benefits result from improved operations. They are the benefits typically identified with the system. Value enhancements are benefits that result from an increase in services to the organization or the organization's clients (more timely response to inquiries). These benefits are service improvements not provided by the status quo alternative. Quantifiable benefits can be measured in monetary terms. An example would be a remote job entry station that replaces the central data entry operation with a resulting cost reduction. Benefits not specifically monetary, but quantifiable, can often be converted into monetary values. This includes benefits such as labor savings and error reduction. The analyst must be careful not to double-count cost savings and benefits. Cost avoidance is one of those potential double-counts. Cost avoidance is future costs that will not be incurred by selecting a proposed alternative, but would be if the status quo remained. An example of this is automating a manual process which avoids the cost of hiring additional personnel to handle the increasing workload of the manual process. But in today's

funding and manpower requirements, there is no guarantee that the status quo (manual process) will be given these additional resources.

Discounting and Present Value: Benefits and costs of different alternatives need to be expressed in terms of their present value. Present value analysis allows one to convert benefits and costs occurring at different years to their current (present) value. Present value analysis assumes that a dollar received today is worth more than a dollar received tomorrow. A dollar invested today begins to earn interest immediately. A dollar received in the future cannot earn interest until it is invested. The difference in present value is the amount of interest earned by the dollar invested today, before the future dollar can be invested. The base year (current year) is used to establish the time difference point for present value calculations. This allows the value of future years to be calculated as if they all occurred in this year. Calculating the present value of benefits and costs is called discounting. This calculation multiplies the benefits and costs by a factor referred to as the discount rate, or opportunity cost of capital. A discount factor is a predetermined factor based on the established discount rate and period. Discount factors to be used are determined by the Office of Management and Budget (OMB) and are published annually as prescribed by OMB Circular A-94. Reducing all dollars to present value allows a comparison of the various alternatives. The most straightforward comparison is Net Present Value (NPV). NPV is the Present Value of benefits minus present value of costs.

ROI is the ratio of the present values of the additional cost to the Government to implement a program alternative in lieu of the Status Quo. Or simply stated, the cost to do the alternative mission is subtracted from the cost to do the status quo mission divided by the cost to implement the alternative minus the cost to maintain the status quo system. Detailed information on calculating ROI can be found in the complete PA&E Guide, pages 55 and 56.

Estimating Non-Quantifiable Benefits: Non-quantifiable and non-cost related benefits, although not applicable in a cost analysis, may be important in the decision process. Since the objective of a cost/benefits analysis is to provide information so that a proper decision can be made, a subjective analysis of the intangible (non-quantifiable) benefits should be included in the analysis. These are accompanying additions to the cost/benefit analysis that are provided to the Overarching Integrated Product Team (OIPT). Non-quantifiable benefits should be systematically categorized and then compared within the categories. Either direct comparison of these measures or a narrative description of the characteristics should be done. Non-quantifiable benefits associated with most programs may includes the following:

- Improved decision-making;
- Better management information;
- Greater versatility or flexibility;
- Better presentation of information;

- Improved report generation (timeliness); and,

- Improved staff morale.

Simple techniques for evaluating non-quantifiable benefits are the following:

- Ranking by their relative importance to the goals and objectives of the initiative. Such a ranking describes the degree to which each alternative achieves a given objective.

- Scoring each alternative on how it contributes to the non-quantifiable benefit. Scoring provides a means to compare across alternatives on individual non-quantifiable factors.

- Assigning values which involves ranking all benefits, both quantifiable and non-quantifiable, by their relevance to project objectives.

Complex techniques for evaluating non-quantifiable benefits are the following:

- This technique weights the non-quantifiable factors based on their priority or contributions to organization goals. It builds on the ranking process and is best suited for larger projects. It may include quantifiable benefits, but they are not required. For complete details on this technique, see pages 57 and 58 of the complete PA&E guide.

1.8 Chapter 5 Budget Interface

Not all life-cycle costs are under the Program Manager's responsibility or control. Many elements are funded by other agencies, are outside the budget cycle, or occur after the system has been transferred to the users and the program office has been disbanded. In spite of this division of funding it is the Program Manager's (PMs) responsibility to accurately reflect these costs in his or her LCCE. It is essential that AIS APEA estimates and budget estimates be consistent.

1.9 Other Useful Resources In The PA&E AIS Economic Analysis Guide

AIS Cost/Benefit Model: User's Manual, page 68. The AIS Cost/Benefit Model is designed to facilitate the presentation and validation of the cost and benefit analyses while reducing redundant entries to the absolute minimum.

Cost Element Structure (CES) Definitions, page 84. The CES provides a standard vocabulary for the identification and classification of cost elements to be used with cost analyses.
Generic CES, page 115. Presents the major cost elements and lower levels of cost elements (2nd level of indenture through 5th level of indenture). This element structure is also contained in Chapter 3 of this document.

Generic Benefit Element Structure, page 122. Presents the benefit element structure derived directly from the major cost categories defined in OMB Circular A-11.

2. ACQUISITION LIFE-CYCLE GUIDANCE

2.1 Overview of Acquisition Management Process

Within the context of the acquisition management process, Return on Investment (ROI) is a key element of information in each of the phases separated by major decision points called milestones. The process begins with the identification of broadly stated mission needs that cannot be satisfied by non-materiel solutions. Acquisition program stakeholders shall consider the full range of alternatives prior to deciding to initiate a new Major Automated Information System (MAIS). System performance, unit production cost estimates, life-cycle costs, interoperability, cost-performance-schedule trade-offs, acquisition strategy, affordability constraints, and risk management shall be major considerations at each milestone decision point, including the decision to start a new program. It is noted that Department of Defense (DoD) Directive 5000.2 defines ROI as equivalent to the internal rate of return. The Directive is broadly organized into six major parts, with each part having significant requirements for the Program Manager (PM).

The six parts are the following:

1. Acquisition Management Process
2. Program Definition
3. Program Structure
4. Program Design
5. Program Assessment and Decision Reviews
6. Periodic Reporting

2.1.1 Part I—The Acquisition Management Process

The purpose of Part 1 is to provide a brief overview of the acquisition management process. The fundamental mandatory guidance issued in Part 1 is that Milestone Decision Authorities (MDAs) must structure every Major Defense Acquisition Program (MDAP) or MAIS to ensure a logical progression through a series of phases designed to reduce risk, ensure affordability, and provide adequate information for decision-making.

2.1.1.1 Milestone Decision Authority (MDA)

This individual is designated in accordance with criteria established by the Under Secretary of Defense (Acquisition & Technology) (USD)(A&T) or by the Assistant Secretary of Defense, Command, Control, Communications, and Intelligence (ASD)(C3I) for Automated Information System (AIS) acquisition programs to approve entry of an acquisition program into the next phase.[1]

[1] DoD 5000.2-R, 15 Mar 96, p. 3.

2.1.1.2 Major Defense Acquisition Program (MDAP)

An acquisition program that is not a highly sensitive classified program (as determined by the Secretary of Defense (SECDEF) and is designated as an MDAP by the USD(A&T) or is estimated by the USD(A&T) to require an eventual total expenditure for research, development, test, and evaluation of more that $355 Million (in Fiscal Year (FY) 96 constant dollars) or involves total procurement expenditures of more than $2.135 Billion (FY96 constant dollars).[2]

2.1.1.3 MAIS

An MAIS is an AIS acquisition program that is designated as an MAIS by the ASD(C3I); has program requirements in excess of $30 Million in any FY (in FY96 constant dollars); has total program costs exceeding $120 Million (in FY96 constant dollars); or has total LCCE greater than $360 Million (in FY96 constant dollars).

When determining whether an AIS is an MAIS, the following shall be aggregated and considered a single AIS:[3] separate AISs that constitute a multi-element program; separate AISs that make up an evolutionary or incrementally developed program; and separate AISs that make up a multi-component AIS program.

Additionally, MAISs do not include highly sensitive classified programs (determined by the SECDEF).[4]

2.1.1.4 Categories of Acquisition Programs and Milestone Decision Authorities

Upon initiation, size and complexity shall generally categorize acquisition programs.

The categories are as follows:

2.1.1.4.1 ACAT I

ACAT 1 Programs are MDAPs or programs designated ACAT 1 by the MDA.

[2] DoD 5000.2-R, 15 Mar 96, p. 3.
[3] Also, see OMB Circular No. A-109, "Acquisition of Major Systems," 1976.
[4] DoD 5000.2-R, 15 Mar 96, p. 3.

2.1.1.4.2 ACAT IA

ACAT 1A Programs are MAISs or programs designated by the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASD(C3I)) to be ACAT 1A.

2.1.1.4.3 ACAT II

ACAT II programs are defined as those acquisition programs that do not meet the criteria for an ACAT I program but do meet the criteria for a major system or are programs designated ACAT II by the MDA.

*Not applicable to ACAT IA programs

2.1.1.4.4 ACAT III

ACAT III programs are defined as those acquisition programs that do not meet the criteria for an ACAT I, an ACAT IA, or an ACAT II. The MDA is designated by the CAE and shall be at the lowest appropriate level. This category includes less than major AISs.

2.1.1.5 Acquisition Phases and Accomplishments

Determining Mission Need Identifying Deficiencies. All acquisition programs are based on identified, documented, and validated mission needs. Mission needs may seek to establish a new operational capability, to improve an existing capability, or to exploit an opportunity to reduce costs or enhance performance. If the potential solution could result in a new Acquisition Category IA (ACAT IA), the appropriate Office of the Secretary of Defense (OSD) Principal Staff Assistant (PSA) or the Joint Requirements Oversight Council (JROC) shall review the documented need, determine its validity, establish joint potential, and confirm that the requirements defined in DoD Directive 8000.1 have been met.

2.1.1.5.1 Phase 0: Concept Exploration

Phase 0 consists of competitive, parallel short-term concept studies. The focus of these efforts is to define and evaluate the feasibility of alternative concepts to provide a basis for assessing the relative merits of these concepts at the next milestone decision point. The most promising system concepts shall be defined in terms of initial, broad objectives for cost, schedule, performance, software requirements, opportunities for tradeoffs, overall acquisition strategy, and test and evaluation strategy.

2.1.1.5.2 Phase I: Program Definition and Risk Reduction

During this phase, the program shall become defined as one or more concepts, design approaches, and/or parallel technologies are pursued as warranted. Cost drivers, LCCEs, cost-performance trades, interoperability, and acquisition strategy alternatives shall be considered to include evolutionary and incremental software development.

2.1.1.5.3 Phase II: Engineering and Manufacturing Development

The primary objectives of this phase are to translate the most promising design approach into a stable, interoperable, producible, supportable, and cost-effective design; validate the manufacturing or production process; and demonstrate system capabilities through testing.

2.1.1.5.4 Phase III: Production, Fielding/Deployment, and Operational Support

The objectives of this phase are to achieve an operational capability that satisfies mission needs. Deficiencies encountered in Developmental Test and Evaluation (DT&E) and Initial Operational Test and Evaluation (OT&E) shall be resolved and fixes verified in FOTIE. The production requirement of this phase does not apply to ACAT IA acquisition programs or software-intensive systems with no developmental hardware components.

2.1.1.5.5 Phase IV: Demilitarization and Disposal

The final phase of the system's life cycle is the demilitarization and disposal of the system. As the system is demilitarized and disposed of, the Technical Program Manager (TPM) must take actions necessary to minimize DoD's liability. This involves being aware of the various environmental, safety, security, and health issues concerning the disposal of the system and then maintaining adequate controls to ensure that the proper procedures are followed to minimize DoD's liability.[5]

[5] DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information Systems (MAIS) Acquisition Programs; March 15, 1996.

2.1.1.6 Milestone Decision Points

The Milestone Decision Authority (MDA) shall establish tailored milestone decision points for each acquisition program as early as possible in the program life cycle. At each milestone or program review, the MDA shall determine that the program being reviewed is processing satisfactory and is still required under current DoD strategic plan (GPRA)

2.1.1.6.1 Milestone 0: Approval to Conduct Concept Studies

Approval to Conduct Concept Studies. For ACAT IA programs, the JROC, or the cognizant OSD PSA, validates the mission need and process integrity in compliance with DoD Directive 8000.1, and the ASD(C3I) convenes a Milestone 0 Overarching Integrated Product Team (OIPT).

2.1.1.6.2 Milestone I: Approval to Begin a New Acquisition Program

Approval to Begin a New Acquisition Program. The purpose of the Milestone I decision point is to determine if the results of Phase 0 warrant establishing a new acquisition program and to approve entry into Phase I, Program Definition and Risk Reduction. At Milestone I, the MDA shall approve the acquisition strategy, the Cost as an Independent Variable (CAIV) objectives, the acquisition Program Baseline, and the Phase I exit criteria. The Director, Operational Test and the Evaluation (DOT&E) and Director, Test, Systems Engineering and Evaluation (DTSE&E) shall approve the Test and Evaluation Master Plan (TEMP) for all OSD test and evaluation oversight programs.

2.1.1.6.3 Milestone II: Approval to Enter Engineering and Manufacturing Development

Approval to Enter Engineering and Manufacturing Development. The purpose of the Milestone II decision point is to determine if the results of Phase I warrant continuation of the program and to approve entry into Engineering and Manufacturing Development (applies to both hardware and software). At this milestone, the MDA shall approve the acquisition strategy, the CAIV objectives, and the Acquisition Program Baseline (APB). The DOT&E and DTSE&E shall approve the TEMP for all OSD test and evaluation oversight programs. Phase II and LRIP exit criteria, LRIP quantities and vaiver from fill-up, system-level LFT&E if applicable.

2.1.1.6.4 Milestone III: Production or Fielding/Deployment Approval

Production or Fielding/Deployment Approval. The purpose of the Milestone III decision point is to authorize deployment for an ACAT IA program. At this milestone, the MDA shall approve the following: the acquisition strategy, the APB, the Phase III exit criteria, and the provisions for evaluation of post-deployment performance.

2.1.2 Part II—Program Definition

The purpose of Part 2 is to describe mandatory procedures for translating broadly stated mission needs into a set of more sharply defined performance specifications. Use of these procedures is intended to ensure MAISs are well defined; carefully structured to reflect a judicious balance of cost, schedule, and performance; and compatible with mission needs, available technology, and affordability constraints. Part 2 issues the following fundamental mandatory guidance:

- Acquisition programs may be initiated in response to a military threat, for economic reasons, to exploit technological opportunities, or for other reasons;
- Programs initiated in response to a military threat shall be based on authoritative threat information (normally not applicable to MAIS acquisition programs);
- Operational performance objective minimum acceptable requirements shall be documented;
- Components shall perform rigorous analyses of alternative affordability to aid decision-makers; and,
- Programs shall be fully funded.

2.1.2.1 Mission Needs Statement (MNS)

DoD Components shall document performace deficiencies in current capabilities and opportunities to provide new capabilities in an MNS expressed in broad operational terms. The MNS shall identify and describe the mission [6] deficiency; discuss the results of mission area analysis; describe why non-materiel changes are not adequate to correct the deficiency; identify potential materiel alternatives; [7] and describe any key boundary condition operational environments that may impact satisfying the need such as information operations.

2.1.2.2 Operational Requirements Document (ORD)

[6] Contained in the DoD strategic plan and the mission
[7] Identify linkage to the DoD strategic plan:

At each milestone beginning with program initiation (usually Milestone I), threshold objectives initially expressed as measures of effectiveness or performance and minimum acceptable requirements for the proposed concept or system shall be documented by the user or user's representative in an ORD. Appendix II, DoD Regulation 5000.2-R provides the mandatory format for the ORD for ACAT I and ACAT IA programs. The ORD is a formatted statement containing operational performance parameters for the proposed concept or system. It shall be initially prepared by the user or user's representative. The Service Chief of Staff or his or her designated representative (or DoD Component Head if not a Service) shall approve it prior to each milestone decision point and submit it to the DoD Component Acquisition Executive or appropriate MDA to be used in the preparation of program documentation such as baseline specifications.

2.1.2.3 Analysis of Alternatives

An Analysis of Alternatives is part of the CAIV process and shall be prepared and considered at appropriate milestone decision reviews of ACAT I and ACAT IA programs, beginning w/program initiation (usually Milestone I). These analyses are intended to aid and document decision-making, foster joint ownership, and afford a better understanding of subsequent decisions.

2.1.2.4 Preparation Responsibilities

For ACAT IA program, the PSA is responsible for the mission area in which a deficiency or opportunity has been identified and normally prepares the analysis of alternatives. For ACAT IA program, the PSA, or as delegated, but not the TPM, is responsible for determining the independent activity responsible for preparing the analysis. The lead DoD Component for a joint program is responsible for ensuring that a comprehensive analysis is prepared for a joint program. For ACAT IAM programs, the DoD Component Head or designated official shall ensure coordination with the Under Secretary of Defense (Acquisition and Technology) (USD(A&T)) or ASD C3I staff, the Joint Staff (or PSA) staff, the DOT&E staff, and the Director, Program Analysis & Evaluation (PA&E) staff takes place early in the development of the alternatives analysis.

2.1.2.5 Milestone Decision Reviews

Normally, the DoD component completes the analysis and documents its finding in preparation for a program initiation decision. The MDA may direct updates to the analysis for subsequent decision points, if conditions warrant. For ACAT IA programs, the PM shall incorporate the analysis of alternatives into the cost-benefit element structure.

2.1.2.6 Affordability

These procedures establish the basis for fostering greater program stability through the assessment of program affordability and determination of affordability constraints. Individual program plan strategies for new acquisition programs shall be consistent with the DoD strategic plan. Affordability shall be assessed at each milestone decision point beginning with program initiation (usually Milestone I). The Cost/Performance IPT (CPIPT) shall ensure that cost and benefit data of sufficient accuracy are available to support reasonable affordability judgments for ACAT IA programs. DoD Component Heads shall consult with the USD(A&T) or the ASD(C3I), as appropriate, on Program Objective Memoranda (POM) and Budget Estimate Submissions (BES) that contain a significant change in funding for, or reflect a significant funding change in, any program subject to review by the Defense Acquisition Board (DAB) or the DoD Chief Information Officer.

2.1.2.6.1 Overview of the Planning, Programming, and Budgeting System (PPBS)

The PPBS is the system of policies and procedures that the DoD uses to develop and document its mid-range plan, mid-term resource program, and near-term budgets. This process defines requirements then allocates budget dollars to them, in terms of dollar and manpower resources.

The Future Years Defense Program (FYDP) is the official database for the PPBS that summarizes the DoD's resource history and projections. There are three points in the PPBS cycle where the FYDP is officially updated based on formal submission of the following decision documents by each OSD component:[8]

1. POM: Submitted to OSD in May or June of the even FY (i.e., FY96, FY98, etc.)

2. BES: Submitted to OSD in September or October of every FY

3. President's Budget (PB): Submitted by the President to the Congress each February of every FY

The FYDP is a current projection of resource requirements for the next seven FYs (i.e., POM submitted in June FY96 contained funding data through FY03). And, each time the FYDP is updated, the resource projections are updated for every FY included in the submission.

Finally, adjustments are made to the FYDP by the issuance of Defense Management Review Decisions (DMRDs) from the senior decision-making body of the PPBS - the Defense Planning and Resources Board (DPRB). This board is chaired by the Deputy SECDEF and meets to deliberate and decide on resource issues throughout the PPBS life cycle. In particular, the DPRB reviews each component's POM and BES submission and issues the new DMRD between the BES and PB submissions (usually sometime in December or January). The effect of the DMRD is usually to reduce the previously approved funding stream for the FYDP.[9]

[8] DoD Corporate Information Management, "Functional Economic Analysis Guidebook," January 1993, Section G.
[9] DoD Corporate Information Management, "Functional Economic Analysis Guidebook," January 1993, Section G.

Therefore, it is critical for the TPM to take into consideration the approved FYDP for the system. What is current and forecast funding for the system? Is the system fully funded? Or, does the system currently have Unfunded Requirements (UFRs)? What are the impacts of not funding these UFRs - at every level (i.e., Military Treatment Facility (MTF), region, Military Health System (MHS), DoD, and other)? How much money is in the overall POM for the system? If the system's projected costs are outside of the current approved funding levels, the TPM has to justify any increases to the DPRB. At that time, a critical success element would be the projected benefits of the system over and above these forecast costs (i.e., ROI).

2.1.2.7 Full Funding of Acquisition Programs Reviewed by the DAB or OIPT

When the DAB or OIPT reviews a program, the DoD Component Head responsible for the program shall submit to the USD (A&T) or ASD(C3I) the funding for that program contained in the FYDP most recently approved by the SECDEF. The DoD Component Head shall also provide a description of the best possible acquisition strategy that could be implemented with the currently approved program funding along with the preferred DoD component approach if they are different. If, after the DAB or OIPT has reviewed the program, the USD(A&T) or ASD(C3I) concludes that the FYDP funding for the program will not support the program as presented to the DAB or OIPT, the DoD Component Head shall commit to incorporate appropriate funding in the next FYDP update.

2.1.3 Part III—Program Structure

2.1.3.1 Purpose

The purpose of this part is to identify the elements that are necessary to structure a successful program. These elements are contained in strategies that are proposed by the Program Manager (PM) and approved by the Milestone Decision Authority (MDA) or other management, and provide an historical record of the program's maturation and decision process. Program strategies are based on the exercise of good judgement and common sense, and include innovative ways to achieve program success.

2.1.3.2 Program Goals

Every acquisition program shall establish program goals for the minimum number of cost, schedule, and performance parameters that describe the program. Program goals shall be linked to the DoD Strategic Plan and other appropriate subordinate strategic plans, such as Component and functional strategic plans, and to the Strategic Information Resources Management Plan required by the Paperwork Reduction Act of 1995. These program goals shall be identified as objectives thresholds.

2.1.3.3 Objective Thresholds

Rules governing the establishment of objective thresholds as they apply to MAIS are found in DoD Directive 5000.2-R, Part 3.

2.1.3.4 Acquisition Program Baselines

Every acquisition program shall establish an Acquisition Program Baseline (APB) to document the cost, schedule, and performance objective thresholds of that program beginning at program initiation. The format for the APB is included in the Consolidated Acquisition Reporting System (CARS).

2.1.3.5 Preparation and Approval

The PM, in coordination with the user, shall prepare the APB at program initiation for ACAT I and ACAT IA programs, at each subsequent major milestone decision, and following a program restructure or an unrecoverable program deviation. The MDA shall approve the APB. For ACAT I and ACAT IA programs, the MDA shall not approve the APB without the coordination of the USD(Comptroller) and the JROC or, in the case of ACAT IA programs, the PSA in place of the JROC (where applicable).

2.1.3.6 Acquisition Program Baseline (APB) Content

The APB shall contain only the most important cost, schedule, and performance parameters. The total number of cost, schedule, and performance parameters in an APB shall be limited as described below.

2.1.3.6.1 Performance

The total number of performance parameters shall be the minimum number needed to characterize the major drivers of operational effectiveness suitability, schedule, technical progress, and cost. This minimum number shall include the key performance parameters described in the ORD and validated by the JROC for inclusion in the APB. For AIS programs, an important performance parameter may involve economic benefit or return on investment.

2.1.3.6.2 Schedule

The schedule parameters shall include program initiation, major milestone decision points, initial operating capability, and any other critical system events. These specific other critical events shall be proposed by the TPM and approved by the MDA for each program.

2.1.3.6.3 Cost

The cost parameters shall reflect the total program and be realistic cost estimates, based on a careful assessment of risk, and realistic appraisals of the level of costs most likely to be realized. The amount budgeted shall not exceed the total cost threshold estimated in the APB. For ACAT IA programs, the ACAT I cost parameters apply, with the addition of military pay and the cost of acquisition items procured w/defense working capital funds (DWCF).

2.1.3.7 Exit Criteria

MDAs shall use exit criteria to establish goals for ACAT I and ACAT IA programs during an acquisition phase. At each milestone review, the PM shall propose exit criteria appropriate to the next phase of the program. The MAIS Quarterly Report shall be the mechanism for status reporting of exit criteria for ACAT IA programs.

2.1.3.8 Acquisition Strategy

A primary goal in developing an acquisition strategy shall be to minimize the time and cost of satisfying an identified, validated need, consistent with common sense and sound business practices. Essential elements in this context include, open systems, sources, risk management, cost as an independent variable, contract approach, management approach, environmental considerations modeling and simulation approach, warranty considerations, and source of support.

2.1.3.8.1 Open Strategies

PMs shall establish open systems objectives and document their approach specifying the level(s) of systems, subsystems, and/or components to be acquired, and devise an open systems strategy to achieve these objectives. An open systems strategy focuses on fielding superior warfighting capability more quickly and more affordably by using multiple suppliers and commercially supported practices; products, specifications, and standards, which are selected based on performance; cost; industry acceptance; long-term availability and supportability; and upgrade potential.

2.1.3.8.2 Sources

In developing and updating the acquisition strategy, the PM shall consider all prospective sources of supplies and/or services that can meet the need, both domestic and foreign.

2.1.3.8.3 Cost, Schedule, and Performance Risk Management

The PM shall establish a risk management program for each acquisition program to identify and control performance, cost, and schedule risks.

2.1.3.8.4 Cost As an Independent Variable (CAIV)

Cost objectives shall be set to balance mission needs with projected out-year resources, taking into account anticipated process improvements in both DoD and defense industries.

2.1.3.8.5 Cost/Performance Tradeoffs

Cost reductions shall be accomplished through cost/performance tradeoff analyses, which shall be conducted before an acquisition approach is finalized. To facilitate that process, the Overarching IPT (OIPT) for each ACAT I and ACAT IA (as required) program shall establish a CPIPT. By program initiation (usually Milestone I), each ACAT I and ACAT IA TPM shall have established life-cycle cost objectives for the program through consideration of projected out-year resources, recent unit costs, parametric estimates, mission effectiveness analysis and trades, accident attrition trade studies, technology trends, and other relevant considerations such as commercial vs. DoD specifications and the open system strategy and design.

2.1.3.8.6 Cost Management Incentives

Requests for Proposals (RFPs) shall be structured to provide incentives to the contractor to meet or exceed cost objectives.

2.1.3.8.7 Cost Performance

The purpose of earned-value management systems (EVMSs) criteria is to provide the contractor and the Government PM with accurate data to monitor execution of their program.

2.1.3.8.8 Continuous Acquisition and Life-Cycle Support (CALS [Digital Data])-Acquisition Program Itegrated Digital Enviroment (IDE)

Beginning in FY97, all new contracts shall require on-line access to, or delivery of, their programmatic and technical data in digital form, unless analysis shows that life-cycle time or life-cycle costs would be increased by doing so.

2.1.3.8.9 Management Approach

The acquisition strategy shall be developed in sufficient detail to establish the managerial approach that shall be used to achieve program goals. The PM shall streamline all acquisitions so that the acquisitions contain only those requirements that are essential and cost-effective.

2.1.3.8.10 Joint Program Management

Any acquisition system, subsystem, component, or technology program that involves a strategy that includes funding by more than one DoD Component during any phase of a system's life cycle shall be defined as a joint program. Joint programs shall be consolidated and co-located at the location of the lead Component's program office, to the maximum extent practicable. The JROC, or PSA for ACAT IA programs, shall review and validate ACAT I or ACAT IA Component MNS and ORDs, as appropriate, and shall recommend establishment of joint programs based on their joint potential. DoD Component Heads shall also recommend establishment of joint programs. The decision to establish a joint program shall be made by the MDA, who shall designate the lead Component as early in the acquisition process as possible.

2.1.3.8.11 Information Sharing and DoD Oversight

DoD oversight activities (i.e., contract administration offices, contracting offices, technical activities, and program management offices) shall consider all relevant and credible information that might mitigate risk before designing and applying direct DoD oversight of contractor operations.

2.1.3.8.12 Test and Evaluation

Test and evaluation programs shall be structured to integrate all DT&E, OT&E, modeling, and simulation activities conducted by different agencies as an efficient continuum. Test and evaluation objectives for each phase of an ACAT I and ACAT IA program shall be designed to allow assessment of system performance appropriate to each phase and milestone. Test and evaluation planning shall begin in Phase 0, Concept Exploration. Test and evaluation planning shall address Measures of Effectiveness (MOEs) and Measures Of Performance (MOPs) with appropriate quantitative criteria, test event or scenario description, resource requirements (e.g., special instrumentation, test articles, validated threat targets, validated threat simulations, actual threat systems or surrogates, and personnel) and identify test limitations.

2.1.3.8.13 DT&E

DT&E programs shall do the following:

- Identify potential operational and technological capability limitations of the alternative concept design options being pursued;

- Support the identification of cost-performance trade-offs by providing analyses of the capability limitations of alternatives;

- Support the identification and description of design technical risks;

- Assess progress toward meeting Critical Operational Issues, mitigation of acquisition technical risk, achievement of manufacturing process requirement system maturity;

- Assess validity of assumption and conclusions from the analysis of alternatives;

- Provide data and analysis in support of the decision to certify the system ready for operational test and evaluation; and,

- In the case of automated information systems, support an information systems security certification prior to processing classified or sensitive data and ensure a standards conformance certification.

2.1.3.8.14 Certification of Readiness for OT&E

The developing agency shall prepare a DT&E Report and formally certify that the system is ready for the next dedicated phase of operational test and evaluation to be conducted by the DoD Component operational test activity. The developing agency shall establish maturity criteria and performance exit criteria necessary for certification for operational test. In support of this, risk management measures and indicators, with associated thresholds, that address performance and technical adequacy of both hardware and software shall be defined and used on each program. A mission impact analysis of criteria and thresholds that have not been met shall be completed prior to certification for operational tests.

2.1.3.8.15 OT&E

OT&E programs shall be structured to determine the operational effectiveness suitability of a system under realistic conditions (e.g., combat) and to determine if the minimum acceptable operational performance requirements, as specified in the ORD, have been satisfied.

2.1.3.8.16 Test and Evaluation Master Plan (TEMP)

The TEMP shall focus on the overall structure, major elements, and objectives of the test and evaluation program that is consistent with the acquisition strategy. It should include sufficient detail to ensure the timely availability of both existing and planned test resources required to support the test and evaluation program. It shall do the following:

- Be prepared for all ACAT I and ACAT IA program other acquisition programs designated for DOT&E or Office of the Secretary of Defense (OSD) test and evaluation oversight;

- Be approved by the DOT&E and the DTSE&E;

- Provide a road map for integrated simulation, test, and evaluation plans; schedules; and resource requirements necessary to accomplish the test and evaluation program.

The TEMP format and procedures are provided in Appendix III, DoD 5000-2-R.

2.1.3.8.17 Life-Cycle Resource Estimates

For all ACAT I and ACAT IA programs, an LCCE shall be prepared by the program office in support of program initiation (usually Milestone I) and all subsequent milestone reviews. For ACAT IA programs, the estimate shall include life-cycle benefits in addition to life-cycle costs.

2.1.3.8.18 LCCE

The LCCE shall be the following:

- Explicitly based on the program objectives, operational requirements, contract specifications for the system, and, for ACAT IA programs, a life-cycle cost and benefit element structure agreed upon by the Integrated Product Team (IPT);

- Comprehensive in character, identifying all elements of cost that would be entailed by a decision to proceed with development, production, and operation of the system regardless of funding source or management control;

- For ACAT I programs, consistent with the cost estimates used in the analysis of alternatives and the manpower estimates behind the operation and support costs shall be consistent with the manpower estimate; and,

- Neither optimistic nor pessimistic, but based on a careful assessment of risk reflecting a realistic appraisal of the level of cost most likely to be realized.

For all ACAT IA programs, the PSA or sponsoring DoD Component shall ensure that a Component cost analysis is created for Milestone I and updated for Milestone II.

2.1.4 Part IV—Program Design

2.1.4.1 Purpose

The purpose of Part IV is to establish the basis for a comprehensive and disciplined approach to the design of MAIS Acquisition Programs. Part IV mandates that TPMs use the concepts of Integrated Process Product Development (IPPD) and systems engineering throughout the program design process to translate operational requirements into a system solution.

2.1.4.2 IPPD

The PM shall employ the concept of IPPD throughout the program design process to the maximum extent practicable.

2.1.4.3 System Engineering

The PM shall ensure that a systems engineering process is used to translate operational need/or requirements into a system solution that includes the design, manufacturing, test and evaluation, and support processes products. The systems engineering process shall establish a proper balance between performance, risk, cost, and schedule, employing a top-down iterative process of requirements analysis, functional analysis allocation, design synthesis verification, and system analysis control. The systems engineering process shall do the following:

- Transform operational need requirements into an integrated system design solution through concurrent consideration of all life-cycle needs (i.e., development, manufacturing, test and evaluation, verification, deployment, operations, support, training and disposal);

- Ensure the compatibility, interoperability, and integration of all functional and physical interfaces, so that system definition and design reflect the requirements for all system elements: hardware, software, facilities, people, and data; and,

- Characterize and manage technical risks.

2.1.5 Part V—Program Assessment Decision Reviews

2.1.5.1 Purpose

Part V establishes mandatory procedures for conducting assessment milestone decision reviews of MDAP MAIS acquisition programs. Part V describes the DAB, the senior-level decision-making council for MDAPs, and the OIPT, the similar forum for MAIS acquisition programs. Part V also discusses DAB readiness meetings, the JROC, and the Cost Analysis Improvement Group. Finally, Part V states the Department's policy to "tailor in" program information that supports acquisition decision-making case-by-case, as the program's circumstances dictate. The fundamental mandatory guidance issued in Part V is that MDAs reserve the authority to make major decisions on programs under their jurisdiction, although they may choose to delegate this authority to lower organizational levels.

2.1.5.2 Integrated Product Teams (IPTs) in the Oversight and Review Process

IPTs are an integral part of the defense acquisition oversight and review process. Participation in IPTs is the primary way for any organization to participate in the program. Mandatory guidance relating to these types of IPTs is provided below.

2.1.5.3 Use of Integrated Product Teams (IPTs)

This section describes the process to convene, develop, and implement a Working Integrated Product Team (WIPT) in support of the TPMs responsibilities within the MHS. On 10 May 1995, Secretary Perry directed the DoD to apply the IPPD concept of using IPTs throughout the acquisition process.

2.1.5.3.1 Purpose and Background

The direction for this concept has been published in DoD Directives 5000.1 and 5000.2 and in two subsequent DoD guides "Rules of the Road, A Guide for Leading Successful Integrated Product Teams," dated November 1995 and "Question and Answers from the DoD Offsite Conference: Institutionalizing IPTs," dated July 1995.

2.1.5.3.2 IPTs

IPTs are intended to be an integral part of the defense acquisition oversight and review process. They function in a spirit of teamwork with participants empowered and authorized to make commitments for the organization or the functional area they represent. IPTs are composed of

representatives from all appropriate functional disciplines, working together to build a successful program and enabling decision-makers to make the right decisions.

IPTs operate under the six following broad principles:

1. Open discussions with no secrets: Teams must have full and open discussions, each team member's expertise and contributions must be recognized; the sense of ownership by each member is critical to the success of the IPT process.

2. Qualified, empowered team members: Empowerment is critical to making and keeping the agreements essential to effective IPTs. The key responsibility of TPMs is to train and educate their staff, so they will have the required knowledge and skill to represent their organization and TPM must make all team members aware of any limits to their ability to speak for the principals. The leader of each IPT will usually be the TPM or his or her designee.

3. Consistent, success-oriented, proactive participation: IPTs should be organized to allow all stakeholders to participate. WIPT members should have an alternate to ensure continuity, and contractor participation shall be in accordance with guidance in DoD Directive 5000.2, Part 4.2.1.

4. Continuous "up-the-line" communications: WIPT members are expected to ensure that their leadership is in agreement with what the IPT is doing.

5. Reasoned disagreement: There can be disagreement but it must be reasoned disagreement based on an alternative plan of action rather than unyielding opposition. Issues that cannot be resolved must be identified early for resolution at the appropriate level.

6. Issues raised and resolved early: Agreement is essential to the IPT's success. Early identification of nonresolvable issues must be raised as quickly as possible to the appropriate decision-making level.

At the TPM level, the WIPT is the tool best designed to assist with program management.

2.1.5.3.3 Working Integrated Product Teams (WIPTs)

WIPTs focus on a particular topic such as cost/performance, test, or contracting to support the development of strategies for acquisition and contracts, cost estimates, etc. WIPTs assist the TPM's planned program structure and documentation of resolve issues. All WIPTs must be staffed and structured to meet the requirement of the specific TPM.

Three basic tenets are required:

1. The TPMs are in charge of the program.

2. IPTs are advisory bodies to the TPMs.

3. Direct communication between the program office and all levels in the acquisition oversight and review process is expected as a means of exchanging information and building trust.

WIPTs will provide the following support:

- Program Planning;
- Identification of opportunities for acquisition reform;
- Identification and resolution of program issues; and,
- Assessment of program status.

2.1.5.3.3.1 Role Responsibilities

The role responsibilities of the WIPTs are the following:

- Assist the TPM in developing strategies in program planning, as requested by the TPM;

- Establish IPT plan of action and milestones;

- Propose tailored document and milestone requirements;

- Review and provide early input to documents;

- Coordinate WIPT activities with the OIPT members;

- Resolve or elevate issues in a timely manner; and,

- Assume responsibility to obtain principals' concurrence on issues, as well as with applicable documents or portions of documents.

2.1.5.3.3.2 Membership

MHS WIPT and IPT membership should include program personnel (government and contractor) with appropriate functional knowledge and experience. The MHS currently has several well-established working groups and committees with subject matter experts on a variety of topics. The TPM should carefully review all currently established working group committees, to

determine if they may be appropriate to task with specific issues that arise rather than establishing a "new" group. The TPM must maximize the use of existing work group structure to ensure that any newly created organizations are managed for maximum efficiency.

2.1.5.3.3.3 Orienting the Team Members

To ensure a common level of understanding among all WIPT members the TPM should provide a comprehensive overview briefing at the first meeting of the members. In addition, the TPM should present their proposed program strategy, documentation requirements, and WIPT structure. The members should agree on a meeting management approach to include the following:

- Agendas: detailed agendas, supporting material timelines must be distributed in advance of all meetings to insure maximum prepared participation at all meetings.

- Frequency of Meetings: Meetings can be held as frequently as needed but must only be called for a particular purpose at a scheduled time. Meetings should be scheduled in association with product completion date and the resolution of action items from an earlier meeting.

- Meeting Summaries: Should be brief and specific, suggested contents are the following :

    - Record attendance;
    - Document any decision or agreements reached by the IPT;
    - Document action item suspenses;
    - Set the agenda for the next meeting; and,
    - Frame issues for higher-level resolution.

2.1.5.4 Overarching Integrated Product Teams (OIPT) Procedure Assessments

In support of all ACAT I and ACAT IAM programs, an OIPT shall be formed for each program to provide assistance, oversight, and review as that program proceeds through its acquisition life cycle. The DASD (C3I Acquisition) will designate the OIPT Leader for each ACAT IAM program. OIPTs shall be composed of the TPM, Program Executive Officer (PEO), Component Staff, Joint Staff, USD(A&T) staff, and the OSD staff principals or their representatives, involved in oversight and review of a particular ACAT I or ACAT IAM program. The OIPT leader for ACAT I or ACAT IAM programs shall provide an integrated assessment to the DAB or OIPT chairs, principals, and advisors at major program review milestone decision reviews using information gathered through the IPT process.

2.1.5.5 WIPTs Procedures, Roles, and Responsibilities

The TPM, or designee, shall form and lead an Integrating IPT (IIPT) to support the development of strategies for acquisition and contracts, cost estimates, evaluation of alternatives, logistics management, cost-performance trade-offs, etc. While there is no one-size-fits-all WIPT approach, there are three basic tenets to which any approach should adhere:

1. The TPM is in charge of the Program.

2. IPTs are advisory bodies to the TPM.

3. Direct communication between the program office and all levels in the acquisition oversight and review process is expected as a means of exchanging information and building trust.

2.1.6 Part VI—Periodic Reporting

2.1.6.1 Purpose

Part VI describes mandatory reports that must be prepared periodically to provide Executive Council with adequate information to oversee the acquisition process and make necessary decisions. Mandatory reporting includes the Defense Acquisition Executive Summary, the Selected Acquisition Reports, unit cost reporting, test results reporting, and contract performance reporting.

2.1.6.2 Cost, Schedule, and Performance Program Reports

This part establishes mandatory policies and procedures for accomplishing periodic and phase reporting by the following:

- Evaluating program accomplishment progress towards meeting cost, schedule, and performance goals; and,

- Providing periodic reports to MDAs with adequate information to oversee the acquisition process.

There are a number of reporting standards which AIS must comply with. They include:

- Cost Element Structure (CES);
- Work Breakdown Structure (WBS);
- Cost/Schedule Status Report (C/SCSC);
- Contract Management Report (CMR);

- Contractor Cost Data Reporting (CCDR);
- Cost Performance Report (CPR);
- Cost/Schedule Status Report (C/SSR); and,
- Contracts Funds Status Report (CFSR).

A brief discussion of each reporting standard follows.

2.1.6.2.1 Cost Element Structure (CES)

CES is required for all AISs undergoing DoD review.[10] The hierarchical CES is the standard tool used for identification and classification of cost elements to be used with cost analyses.

All LCCEs are reported using the program CES. Figure 2.1.6.2.1 is an example of a generic CES.[11]

[10] DoD Automated Information System (AIS) Economic Analysis (EA) Guide, 1 May 95, Attachment B, p. 1.
[11] DoD Automated Information System (AIS) Economic Analysis (EA) Guide, 1 May 95, Attachment B, Figure B-5.

1.0 Investment

1.1 Program Management 1.1.1 Personnel 1.1.2 Temporary Duty Yonder (TDY) 1.1.3 Other Government Support 1.1.4 Other	1.5 Outsource/Central/Mega Center Investment 1.5.1 Capital Investment 1.5.2 Software Development 1.5.3 System User Investment
1.2 Concept Exploration 1.2.1 Engineering Analysis and Specifications 1.2.2 Concept Exploration Hardware 1.2.3 Concept Exploration Software 1.2.4 Concept Exploration Data 1.2.5 Exploration Documentation 1.2.6 Concept Exploration Testing 1.2.7 Facilities 1.2.8 Other (Log Support., Environmental, etc., as required)	1.6 System Initialization, Implementation, and Fielding 1.6.1 Initial Training 1.6.2 System Integration, Site Test/Acceptance 1.6.3 Common Support Equipment 1.6.4 Site Activation and Facilities Preparation 1.6.5 Initial Supplies 1.6.6 Engineering Changes 1.6.7 Initial Logistics Support 1.6.8 Office Furniture and General Support Furniture 1.6.9 Data Upload and Transition 1.6.10 Base/Installation Communications 1.6.11 Other
1.3 System Development 1.3.1 System Design and Specification 1.3.2 Develop, Prototype and Test Site Investment 1.3.3 Software Development 1.3.4 System Documentation 1.3.5 Data Development and Transition 1.3.6 Database Standards/Dictionary 1.3.7 Training and Development 1.3.8 Test and Evaluate 1.3.9 Develop Logistics Support 1.3.10 Facilities 1.3.11 Environmental 1.3.12 Other Development	1.7 Upgrade/P3I 1.7.1 Upgrade Development 1.7.2 Life Cycle Upgrades Procure 1.7.3 Central Mega Center Upgrades
1.4 System Procurement 1.4.1 Deployment Hardware 1.4.2 System Deployment Software 1.4.3 Initial Documentation Requirements 1.4.4 Logistics Support Equipment 1.4.5 Initial Spares 1.4.6 Warranties	1.8 Disposal/Reuse 1.8.1 Capital Recoupment 1.8.2 Retirement 1.8.3 Environmental/Hazardous Disposal

Figure 2.1.6.2.1
Generic CES

2.0 System Operations and Support

2.1 System/Material/Item Management 2.1.1 Personnel 2.1.2 TDY 2.1.3 Other Government Support 2.1.4 Other	2.5 Mega Center Operations and Maintenance Support
2.2 Annual Operations Investment 2.2.1 Annual System Maintenance Investment 2.2.2 Replenishment Spares 2.2.3 Replenishment Supplies and Consumables	2.6 Data Maintenance 2.6.1 Mission Application Data 2.6.2 Standard Administrative Data
2.3 Hardware Maintenance 2.3.1 Organic Hardware Maintenance 2.3.2 Contract Maintenance Support 2.3.3 Other Hardware Maintenance	2.7 Unit/Site Operations 2.7.1 System Operation Personnel 2.7.2 Utility Requirements 2.7.3 Fuel and POL 2.7.4 Facilities Lease and Maintenance 2.7.5 Communications 2.7.6 Base Operating Support 2.7.7 Recurring Training 2.7.8 Miscellaneous Support
2.4 Software Maintenance 2.4.1 Commercial-Off-The-Shelf (COTS) 2.4.2 Application/Mission (Non-COTS) 2.4.3 Commercial Software (Non-COTS) 2.4.4 Data Center Software 2.4.5 Other Software	2.8 Environmental and Hazardous Material Storage and Handling
	2.9 Contract Leasing

3.0 Alternative Phase Out (SQ Profile)

3.1 System Management	3.3 SQ Phase Out Operations and Support 3.3.1 Hardware Maintenance 3.3.2 Software Maintenance 3.3.3 Unit/Site Operations 3.3.4 Mega Center Operating and Maintenance Support
3.2 Phase Out Investment 3.2.1 Hardware 3.2.2 Software 3.2.3 Environmental and Hazardous Material Storage and Handling	**Figure 2.1. . .** M ega Center Operating and Maintenance Support
	3.5 Phase Out Contracts

Figure 2.1.6.2.1
Generic CES (cont.)

2.1.6.2.2 WBS

DoD 5000.2-R (15 Mar 96) directs that a program WBS be established in accordance with MIL-HDBK-881.[12] This directive is applicable to the acquisition of defense materiel items (or major modifications) that are the following:

- Established as an integral program element[13] of the FYDP[14]; or,
- Otherwise designated by the DoD Component or the Under Secretary of Defense (Acquisition).

Specifically, it pertains only to those elements of R&D and investment that are applicable to contracted efforts. This standard is to be used by both contractor DoD Components.

The WBS provides a framework for specifying the objectives of the program by first defining the program in terms of hierarchically related product-oriented elements (not functionally-oriented) and the work processes required for their completion. Each element of the WBS is a summary point for assessing technical accomplishment for measuring the cost and schedule performance accomplished in attaining these objectives.[15]

Therefore, at the lowest level, the WBS elements should represent identifiable work products, whether they be equipment, data, or service products (normally, a program WBS is limited to the first three levels, but may be expanded, as necessary).[16]

As resources are utilized and work progresses on each task, current technical, schedule, cost, and Estimates At Completion (EAC) are reported by specific WBS elements.[17]

This WBS shall provide a framework for program and technical planning, cost estimating, resource allocations, performance measurements, and status reporting and is a product of the systems engineering process.

The WBS associated WBS dictionary shall define the total system to be developed or produced; display the total system as a product-oriented family tree composed of hardware, software, services, data, and facilities; and relate the elements of work to each other and to the end product.[18]

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[12] DoD 5000.2-R, 15 Mar 96, p. 9.

[13] A program element is the basic building block of the FYDP. It is a description of the mission to be undertaken and a list of the organizational entities identified to perform the mission assignment. It may consist of forces, manpower, materiel (real and personal property), services, and associated costs.

[14] The FYDP records, summarizes, and displays decisions that have been approved by the Secretary of Defense (SECDEF) through the PPBS process. For additional information, see PPBS.

[15] MIL-STD-881B, Appendix I, p. 3.

[16] MIL-STD-881B, p. 10. Level 1 is the entire defense materiel item and is usually identified in the PPBS either as an integral program element or as a project or subprogram within an aggregated program element. Level 2 consists of major elements within the Level 1 item (for example, a ship) and Level 3 items are subordinate to the Level 2 items (e.g., the ship's engine unit).

[17] MIL-STD-881B, Appendix I, p. 3.

[18] DoD 5000.2-R, 15 Mar 96, p. 9.

Figure 2.1.6.2.2A shows the difference between a correct and incorrect WBS.[19]

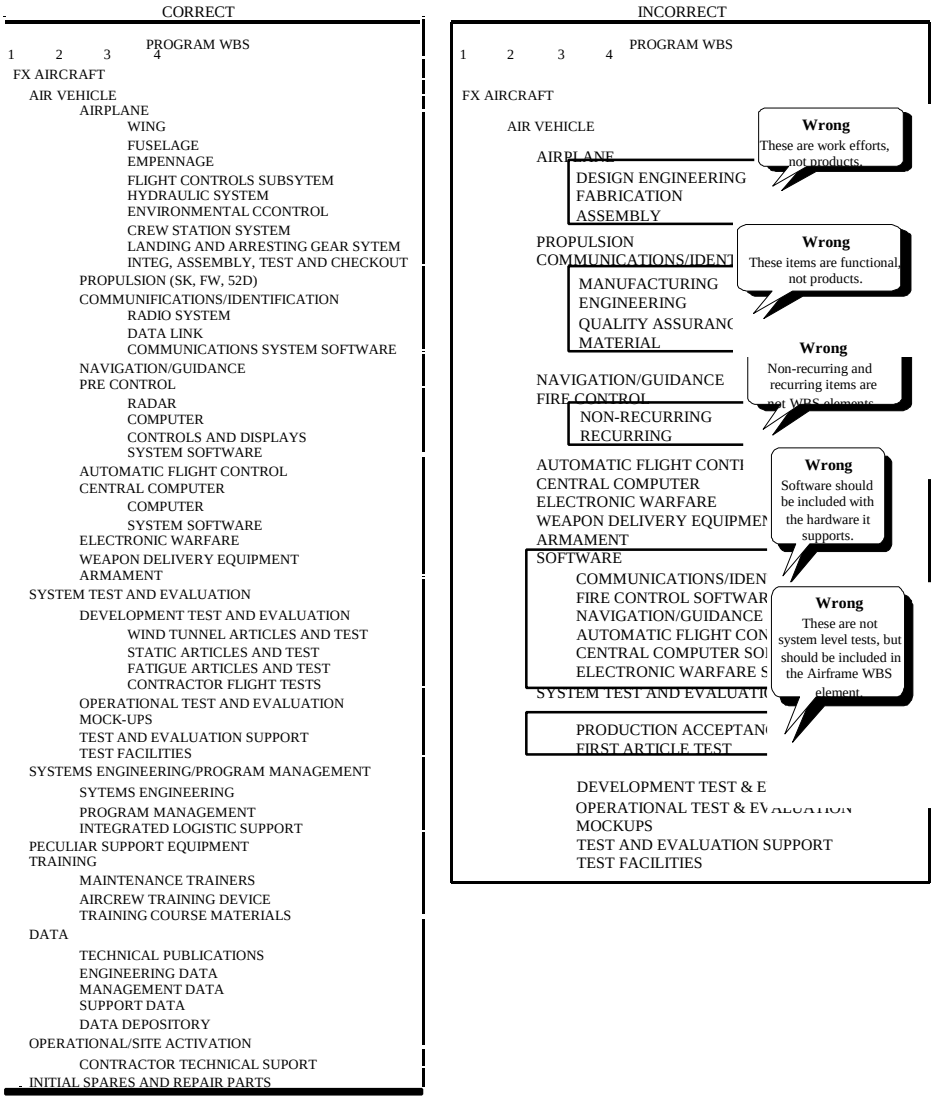

Figure 2.1.6.2.2A
Comparison of Correct and Incorrect Program WBS

[19] MIL-STD-881B, Appendix I, p. 15.

Figure 2.1.6.2.2B shows a WBS for an electronic/automated software system.[20]

MIL-STD-881B

Level 1	Level 2	Level 3
Electronic/ AIS	Prime Mission Product (PMP)	
		Subsystem 1...n (Specify Names)
		PMP Applications Software
		Integration, Assembly, Test, and Checkout
	Platform Integration	
	Systems Engineering/Program Management	
	System Test and Evaluation	
		Development Test and Evaluation
		Operational Test and Evaluation
		Mock-ups
		Test and Evaluation Support
		Test Facilities
	Training	
		Equipment
		Services
		Facilities
	Data	
		Technical Publications
		Engineering Data
		Management Data
		Support Data
		Data Depository
	Peculiar Support Equipment	
		Test and Measurement Equipment
		Support and Handling Equipment
	Common Support Equipment	
		Test and Measurement Equipment
		Support and Handling Equipment
	Operational/Site Activation	
		System Assembly, Installation, and Checkout On-Site
		Contractor Technical Support
		Site Construction
		Site/Ship/Vehicle Conversion

Figure 2.1.6.2.2B
Work Breakdown Structure for Automated Software System

[20] MIL-STD-881B, Appendix B, p. 2.-=[

2.1.6.2.3 C/SCSC

The C/SCSC provides the contractor and the government TPM with accurate data to monitor execution of their program. It also provides uniform evaluation criteria to ensure contractor cost and schedule management control systems are adequate.[21]

The C/SCSC shall be required on all acquisition programs having significant contract/or subcontracts.[22] Additionally, compliance may be required when the Component manager requires assurance that the contractor's cost and schedule management control systems are satisfactory. On contracts deemed not significant enough for C/SCSC applicability, the C/SSR is required.[23]

2.1.6.2.4 CMR

CMR includes the following reports: CCDR, CPRs, C/SSRs, and CFSRs. These reports are required for effective management of defense acquisitions.[24]

2.1.6.2.5 CCDR

These reports are DoD's primary means of collecting contractor cost data. Normally, CCDR is done to the third WBS level, and, at a minimum, these reports are filed after major events or before major milestone reviews.[25]

2.1.6.2.6 CPR

CPRs are required for all contracts under the purview of the C/SCSC and may be required on fixed-price incentive or cost type contracts. CPRs are normally not required for Firm Fixed Price (FFP) contracts, unless cost and schedule visibility are required. CPR data are reported on the same system that the contractor uses for internal management and can be tailored to require less data. The CPR is intended to be the primary means of communication between the contractor and the TPM for reporting cost and schedule trends to date and permitting assessment of their likely affect on future performance of the contract. Includes DD Forms 2734/1, 2734/2, 2734/3, 2734/4, and 2734/5 (DID DI-MGMT-81466).[26] Also, see DoD 5010.12-L.[27]

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[21] DoD 5000.2-R, 15 Mar 96, p. 9.

[22] IBID, p. 9. Significant contracts are R&D, test, and evaluation contracts (or subcontracts) with a value of $70M or more or procurement contracts (subcontracts) with a value of $300M or more (in then year dollars). Compliance with C/SCSC is not required on firm fixed price (FFP) contracts (including FFP with price adjustment provisions), time and material contracts, and level-of-effort contracts. Additionally, exceptions may be made by the MDA for individual contracts.

[23] Footnote 11 indicates exceptions to this requirement.

[24] DoD 5000.2-R, 15 Mar 96, pp. 10-11.

[25] DoD 5000.2-R, 15 Mar 96, p. 11.

[26] DoD 5000.2-R, 15 Mar 96, p. 12.

[27] Department of Defense 5010.12-L, Acquisition Management Systems and Data Requirements Control List, October 1993.

2.1.6.2.7 C/SSR

The C/SSR (DD Form 2735, DID DI-MGMT-81467) is used to obtain contract cost and schedule performance data on contracts over 12 months in duration where application of the CPR is not appropriate. No minimum threshold, but not usually required for contracts of less than $6 Million (FY96 constant dollars) and not usually applicable for Firm Fixed Price (FFP) contracts. Also, see DoD 5010.12-L.[28]

2.1.6.2.8 CFSR

The CFSR (DD Form 1586, DID DI-MGMT-81468) is used to collect funding data on contracts over six months in duration. There are no specific application thresholds, but careful application to contracts under $1.2 Million (FY96 constant dollars) is necessary to ensure that only the minimum information necessary (for effective management control) is required from the contractors. These reports are not applicable to FFP contracts.[29] Also, see DoD 5010.12-L.[30]

2.1.6.3 Acquisition Program Baseline Reporting

The TPM shall maintain a current estimate of the program actually being executed and shall report the current estimate of each baseline parameter periodically, as requested, to the MDA. For ACAT I and ACAT IA programs, this reporting shall be done quarterly in the Defense Acquisition Executive Summary (ACAT I) or the MAIS Quarterly Report (ACAT IA).

2.1.6.4 MAIS Quarterly Report DD-C3I(Q) 1799

Appendix V, DoD Regulation 5000.2-R, provides the mandatory format to prepare the MAIS Quarterly Reporting. This status reporting system is designed to provide executive management at the Component and OSD levels with the program status, progress, issues, risks, and risk reducers. The quarterly report is essential to the early identification of problem associated plans to initiate corrective actions. The TPM shall provide the report to the MDA in a timely manner to permit prompt action to address reported issue problems. Contained within the Program Information section of the report is a description of the cost and operational benefits expected along with the projected ROI, including a description of how the ROI was determined. Within the context of the MAIS Quarterly Reporting, ROI is equivalent to the internal rate of return.

Life Cycle costs are presented in the Cost portion of the report, and will reflect both the approved and current estimated life-cycle cost for the program.

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[28] Department of Defense 5010.12-L, Acquisition Management Systems and Data Requirements Control List, October 1993.
[29] DoD 5000.2-R, 15 Mar 96, p. 12.
[30] Department of Defense 5010.12-L, Acquisition Management Systems and Data Requirements Control List, October 1993.

The TPM shall submit a quarterly report, through the Program Executive Officer (PEO) for all designated ACAT IA programs. The PEO may add comments but shall not change the TPM assessment. Components shall submit an original and four copies of the quarterly report for all ACAT IA programs, including delegated programs, within 30 days after the close of each quarter. For any ACAT IA program that has been canceled, fully deployed, or is operational, a final close-out report is required for the last reporting period. The initial MAIS Quarterly Status Report is due 30 days after the end of the quarter in which the ACAT IA program is designated an MAIS.

2.1.7 Appendices to DoD 5000 Series

DoD 5000.2-R includes six appendices that specify mandatory formats in the following areas: Consolidated Acquisition Reporting System, ORD, Test and Evaluation Master Plan, Live-Fire Test and Evaluation Plan, MAIS Quarterly Report, and C/SCSC. The seventh appendix is the Glossary, which will be published as Change 1 to the Regulation.

2. MHS IM/IT BENEFITS MANAGEMENT VOCABULARY

3.1 Glossary

Acceptance
The decision that an item, process, or service conforms to specified characteristics defined in codes, standards, or other requirement documents.

Assessment
An all-inclusive term used to denote the act of determining, through a review of objective evidence and witnessing the performance of activities, whether programs, processes, or systems meet specified requirements. Assessments are conducted through implementation of the following actions: audits, performance evaluations, management system reviews, peer reviews, or surveillances, which are planned and documented by trained and qualified personnel.

Avoided Cost
A non-realized cost resulting directly from a specific action taken with the intention of avoiding future economic outlays.

Backcast
A retrospective calculation of the costs incurred within a process, system, or product.

Baseline
A set of data that reflects the state of a process, system, or product prior to the implementation of any improvement initiatives.

Benchmarking
To measure an organization’s products or practices against the best existing products or practices

of the same type; the benchmark defines the 100 percent mark on the measurement scale. The process of comparing and measuring an organization's own performance in a particular process to the performance of organizations judged to be the best in a comparable industry.

Benefits Assessment
The process of quantifying the expected return on investment of an IM/IT proposal of a business case decision package such as an FEA, IMPRB Fact Sheet, or an AIS EA. The predominant consideration in conducting benefits assessment for an AIS is the need to identify, document, and validate those quantitative benefits that will be the most convincing to decision-makers.

Benefits Realization
The continuous cycle of opportunity identification, program development, trial deployment, and feedback.

Break-Even
The point at which the ROI of an investment reaches 0.00; the project has reached the break-even point.

Cost Element Structure (CES)
CES is required in the DoD AIS FEA Guide for all AISs undergoing DoD review. The hierarchical CES is the standard tool used for identification and classification of cost elements to be used with cost analyses.

Data-driven ROI
The quantification of return on investment based on best available data, and managing a program to achieve an specific ROI outcome.

Direct Costs
Expenditures related to the execution of an activity that is accounted in the program's budget.

Forecast
A projected calculation of costs prior to implementing a system, process, or product.

Guideline
A suggested practice that is not mandatory in programs intended to comply with a standard. The words "should" and "may" denotes a guideline; the words "shall" and "must" denote a requirement.

Indirect Costs
Expenditures incurred as a result of a project, but not accounted in its budget.

Life Cycle
All phases of a system including planning, acquisition, operation, maintenance, and disposal.

Metrics
Standards of measure (such as length, area, frequency, etc.).

Net Benefits
All savings, less the cost of the investment.

Net Present Value
The present value of gross benefits less the present value of gross costs.

Normalize
Adjust metrics to allow comparisons with a reference or standard (usually done by using rates or percentages).

Objective
A statement of the general condition or desired result to be achieved within a specified time (e.g., "work safely").

Optimum
A planned result that meets the needs of customer and supplier alike, meets competition, and minimizes the customer supplier's combined costs.

Opportunity Cost
The value of alternative endeavors that were foregone to develop a system, programs, or a process.

Organization
Any program, facility, operation, or division.

Performance Measure(s) or Performance Metric
A parameter useful for determining the degree to which an organization has achieved its goals. Also, a quantifiable expression used to observe and track the status of a process. Also, the operational information that is indicative of the performance or condition of a facility, groups of facilities, or site.

Performance Measurement Category
An organizationally dependent grouping of related performance measures that convey a characteristic of a process, such as cost, quality, access, and medical readiness.

Performance Measurement System
The organized means of defining, collecting, analyzing, reporting, and making decisions regarding all performance measures within a process.

Performance Objective Criteria (POC)
The quantifiable goal, the basis, by which the degree of success in achieving goals is established.

Present Value

The value in today's dollars of a future cash flow discounted back to the present at the required rate of return to account for the opportunity cost of the cash flow.

Productivity
The value added by the process divided by the value of the labor and capital consumed.

Quality
The degree to which a product or service meets customer requirement expectations and actions that provide confidence that quality is achieved.

Return on Investment (ROI)
A measure of the performance on an investment, calculated as the percentage changes in cost, quality, access, and medical readiness,

Risk-Adjusted Assumption
Deterring the mode and reasonable lower and upper points of a forecast assumption. For example, the expected savings are 10 percent of facility maintenance costs +/- 2.5 percent.

Risk Modeling
A statistical technique to incorporate multiple risk adjusted assumptions for cost benefits. The result is a simulation distribution for ROI with a low-, high-, and expected-value ROI.

Strategic Planning
A process for helping an organization envision what it hopes to accomplish in the future, identify and understand obstacle opportunities that affect the organization's ability to achieve that vision, and set forth the plan of activities and resource uses that will best enable the achievement of the goal objectives.

WBS
Framework for specifying the objectives of the program, process, or system by first defining the program in terms of hierarchically related product-oriented elements (not functionally-oriented) and the work processes required for their completion. Pertains only to those elements of R&D and investment that are applicable to contracted efforts. This standard is to be used by both contractors and DoD Components.

3.2 Acronym List

ACAT	Acquisition Category
AIS	Automated Information System
ALOS	Average Length Of Stay
APB	Acquisition Program Baseline
ASCII	American Standard Code for Information Interchange
ASD	Assistant Secretary for Defense
ASD HA	Assistant Secretary of Defense Health Affairs
BES	Budget Estimate Submission
BPI	Business Process Improvement
BPR	Business Process Reengineering
C/SCSC	Cost/Schedule Control Systems Criteria
C/SSR	Cost/Schedule Status Report
C3I	Command, Control, Communication, and Intelligence
CAIV	Cost As an Independent Variable
CALS	Continuous Acquisition and Life-Cycle Support
CARS	Consolidated Acquisition Reporting System
CBA	Cost Benefits Analysis
CCDR	Contractor Cost Data Reporting
CEA	Cost-Effectiveness Analysis
CES	Cost Element Structure
CFSR	Contract Funds Status Report
CMR	Contract Management Report
CPIPT	Cost/Performance Integrated Product Team
CPR	Cost Performance Report
DAB	Defense Acquisition Board
DASD	Deputy Assistant Secretary of Defense
DBOF	Defense Business Operations Fund
DMIM	Defense Medical Information Management
DMRD	Defense Management Review Decision
DoD	Department Of Defense
DOT&E	Director, Operational Test and Evaluation
DPRB	Defense Planning and Resources Board
DT&E	Developmental Test and Evaluation
DTSE&E	Director, Test, Systems Engineering and Evaluation
EA	Economic Analysis
EAC	Estimates At Completion
FEA	Functional Economic Analysis
FFP	Firm Fixed Price
FM	Functional Manager
FM&I	Functional Management and Integration
FPI	Functional Process Improvement
FTE	Full-Time Equivalent
FY	Fiscal Year

FYDP	Future Years Defense Program
GPRA	Government Performance and Results Act
IDP	Integration Decision Paper
IIPT	Integrating Integrated Product Team
IM	Information Management
IM/IT	Information Management/Information Technology
IMPRB	Information Management Project Review Board
IPT	Integrated Product Team
IRM	Information Resources Management
IS	Information System
ISPPO	Information Systems Planning and Program Oversight
IT	Information Technology
ITMRA	Information Technology Management Reform Act
JROC	Joint Requirements Oversight Council
LCCE	Life-Cycle Cost Estimate
LCM	Life Cycle Management
MAIS	Major Automated Information System
MAISRC	Major Automated Information Systems Review Council
MDAP	Major Defense Acquisition Program
MDA	Milestone Decision Authority
MEPRS	Medical Expense and Performance Reporting System
MHS	Military Health System
MNS	Mission Need Statement
MOE	Measure of Effectiveness
MOP	Measure Of Performance
MTF	Military Treatment Facility
OASD(HA)	Office of the Assistant Secretary of Defense (Health Affairs)
OIPT	Overarching Integrated Product Team
OMB	Office of Management and Budget
ORD	Operational Requirements Document
OSD	Office of the Secretary of Defense
OSE	Open System Environment
OT&E	Operational Test and Evaluation
PA&E	Program Analysis and Evaluation
PB	President’s Budget
PEO	Program Executive Officer
POM	Program Objective Memorandum
PPBS	Planning, Programming, and Budgeting System
PSA	Principal Staff Assistant
QA	Quality Assurance
RCMAS	Retrospective Case-Mix Analysis System
ROI	Return on Investment
SECDEF	Secretary of Defense
SG	Surgeon General
TAFIM	Technical Architecture Framework For Integration Management

TEC	TRICARE Executive Committee
TEMP	Test and Evaluation Master Plan
TPM	Technical Program Manager
TRADE	Training Resource Data Exchange
UFR	Unfunded Requirement
USD	Under Secretary of Defense
USD(A&T)	Under Secretary of Defense (Acquisition & Technology)
WBS	Work Breakdown Structure
WIPT	Working-Level Integrated Product Team